



Department of Commerce

Safety & Buildings Division

201 West Washington Avenue

P.O. Box 2658

Madison, WI 53701-2658

Evaluation # 200229-M (Replaces 960026-M)

Wisconsin Building Products Evaluation

Material

Pre-Engineered Metal Building Systems

Manufacturer

Varco-Pruden Buildings
273 Water Street
Evansville, Wisconsin 53536

SCOPE OF EVALUATION

GENERAL: This report evaluates the use of the Pre-Engineered Metal Building Systems manufactured by Varco-Pruden Buildings, through a review of structural performance.

This review includes the cited **Comm** code requirements below in accordance with the current **Wisconsin Building and Heating, Ventilating and Air conditioning Code:**

- **Structural:** The Rigid Frame, Continuous Beam, Truss Beam and Continuous Truss systems were evaluated in accordance with ss. **Comm 53.10, 53.11, 53.12, 53.16, 53.50, 53.51, and 53.53.**



This review includes the cited **International Building Code (IBC)** requirements below in accordance with the **Wisconsin Amended IBC Code (effective 7/01/02):**

- **Structural:** The Rigid Frame, Continuous Beam, Truss Beam and Continuous Truss systems were evaluated in accordance with ss. **IBC 1603.1, 1604.1, 1604.2, 1604.3.1, 1604.3.3, 1604.4, 1604.5, 1605.1, ss. IBC 1606, through 1609, 2208.1 [Comm 62.2208], 2209.1, 2209.2, and 2211.5.**



DESCRIPTION AND USE

General: The primary structural systems used in the buildings (Rigid Frame, Continuous Beam, Truss Beam and Continuous Truss), listed herein, are basically four types. The yield strength of the structural steel is 50,000 psi.

1. The rigid frame system consists of built-up tapered beams and columns with a maximum clear span of 200 feet.
2. The continuous beam system consists of built-up tapered beams and columns with a maximum span of 500 feet. This system utilizes interior columns.
3. The truss beam system consists of a steel truss supported on wide flange columns. The maximum clear span of this system is 120 feet.
4. The continuous truss system is similar to the truss beam system with interior columns with spans up to 500 feet.

BRACING MEMBERS: Lateral bracing is: provided by either diagonal rods or the diaphragm action of the metal cladding or a combination of both. Purlin connections for standing seam roof are acceptable by the department.

CLADDING MATERIAL: consists of 22 gauge, 24 gauge and 26 gauge steel and .032 inch thick aluminum. Yield strength of the steel is 50,000 psi. The yield strength of the aluminum is 27,000 psi.

LISTING OF APPROVED BUILDINGS: The following buildings are adequate to sustain the 3 psf collateral loading in addition to **30 psf** or **40 psf** live load as indicated.

Type of Structure	Span	Eave Height	Bay Spacing	Roof Slope	Design Loads (PSF)
Rigid Frame	30'-200'	10'-30'	20', 25', 30'	1/4:12, 1/2:12	LL = 30 + 3 LL = 40 + 3 WL = 20
Cont. Beam	30'-500'	10'-30'	20', 25', 30'	1/4:12, 1/2:12	LL = 30 + 3 LL = 40 + 3 WL = 20
Truss Beam	30'-120'	10'-30'	20', 25', 30'	1:12	LL = 30 + 3 LL = 40 + 3 WL = 20
Cont. Truss	30'-500'	10'-30'	20', 25', 30'	1/4:12, 1/2:12	LL = 30 + 3 LL = 40 + 3 WL = 20

SECONDARY STRUCTURAL MEMBERS: The purlins and girts are cold-formed 8-1/2-inch "Z" sections. The yield strength of the steel is 55,000 psi.

End Spans	Purlin Size Interior Spans	Number of Bays and Spacing	Purlin Spacing	Snow Loading (psf)
16 gauge	16 gauge	4 @ 20'	5'-0"	30
15 gauge	16 gauge	4 @ 20'	5'-0"	40
13 gauge	16 gauge	4 @ 25'	5'-0"	30
11 gauge	15 gauge	4 @ 25'	5'-0"	40
13 gauge	13 gauge	4 @ 30'	End span 2'-6" o.c. cont., alternating with 2'-6" o.c. simple span. Interior span 5'-0" continuous.	30
11 gauge	13 gauge	4 @ 30'	End spans 4'-0" o.c. cont. and	40

			2'-0" o.c. simple span. Interior spans 4'-0" o.c. continuous.
--	--	--	---

INSULATION: Thermax Insulation Board is comprised of a glass-reinforced polyisocyanurate foam plastic core, nominal density of 2 pcf, aluminum foil faced on both sides. The aluminum foil face is available in various types and finishes to achieve the final product. See **Commerce Product Evaluation Number 200077-I** for more details and information.

PRODUCT APPLICATION-PANEL RIB SYSTEMS: Panel Rib Systems with Thermax Insulation Board consists of Varco-Pruden Panel Rib Roof or Wall Systems with Thermax Insulation Board installed between the roof or wall sheeting and the secondary structural members.

Structural - Primary and secondary structural framing do not require modification to accept Thermax Insulation Board. Varco-Pruden Panel Rib sheeting when out set from the building line by Thermax Insulation Board shall not be considered to contribute to building diaphragm.

Fastener Requirements - Attachment of Panel Rib sheeting to secondary structural members through Thermax Insulation Board shall be by #12-14 x (required length) carbon wall/or roof structural standoff fasteners.

VEE RIB WALLS - Vee Rib Systems with Thermax consist of Varco-Pruden Vee Rib Wall Systems with Thermax Insulation Board installed between the wall sheeting and secondary structural members. Details and/or modifications required to insure Thermax Insulation Board compatibility with Vee Rib Systems are identical to that of Panel Rib with Thermax.

SPAN LOC WALLS - Span Loc Systems with Thermax consist of Varco-Pruden Span Loc Wall Systems with Thermax Insulation Board installed on the interior side of the Span Loc ribs.

SSR ROOFS- SSR Standing Seam Roof Systems consist of Varco-Pruden SSR Standing Seam Roof Panels and interconnecting panel-to-secondary structural SSR clips; sealant, mastic, closures, trim and/or flashing necessary to provide weather tightness and/or finished appearance. Optional roof accessories and optional insulating systems are available consisting of 3", 4", or 6" of blanket insulation, with or without high density polystyrene thermal blocks or Superblock for additional over the purlin insulation, or up to 2-1/2 inches of rigid board insulation. SSR Roof Systems may be used with all Varco-Pruden Primary Framing Systems and secondary structural members (including Transbay joists) with a minimum roof pitch of 1/4:12 (maximum roof pitch of 1:12 for Transbay joists).

CALCULATIONS

All primary steel, built-up sections are manufactured from 50 ksi minimum yield steel, all hot rolled sections from 36 psi minimum yield steel, all light-gauge sections from 55 ksi minimum yield steel designed in accordance with current AISI or AISC Specifications, whichever is applicable.

The design and assembly of structural joints and connections (primary and secondary steel) using high strength steel bolts conform to the "Specification for Structural joints Using ASTM A325 and A307 Bolts" approved by the Research Council on Structural Connections of the Engineering Foundation.

All secondary structure: is designed in accordance with the current AISI or AISC Specifications, whichever is applicable.

All cladding material is designed in accordance with 1989 Edition “Specifications for Design of Light Gauge Cold Formed Steel Structural Members”-AISI.

Sample calculations are on file with the department.

TESTS AND RESULTS

The tests and results listed below cover the current WI Building Code **Comm**.

Weld test data satisfying **s. Comm 53.53(10)** of the Wisconsin Building Code has been submitted.

LIMITATIONS OF APPROVAL

The limitations below apply both to the Building Code Applicable to Projects Submitted for Review Prior to July 1, 2002 and the **Wisconsin Amended IBC 2000 Code (effective 7/01/02)**.

The approval number permits plan submittal without repetitious structural calculations. This approval is for uniform loading condition only. Any special concentrated loading condition is not included under this approval number and requires complete structural calculations.

This approval is not for a specific building, but rather an approval of the building design concept. The metal buildings must be constructed in accordance with the sample calculations (design concept) and details on file with the department.

INFORMATION REQUIRED ON PLANS SUBMITTED FOR APPROVAL

This evaluation number, member properties, size of all members, layout and other general requirements of **s. Comm 50.12** must be indicated on each plan submittal. **NOTE: Member sizes may be shown in the building plan submittal or subsequent component plan submittal.**

Foundation plans (by others) must show details of footings as well as anchor bolt sizes and side thrust restraint when required.

The location and sizes or critical dimensions of all major structural members (rigid frames, columns, beams, end walls, etc.) must be shown. This must include the web and flange sizes at the base, haunch, ridge, and any other location where member sizes change.

The size and spacing of purlins and girts must be shown on a cross-section or on roof and elevation framing plans.

The size and location of all diagonal bracing must be shown.

Thermal performance requirements shall comply with the cited **Comm** code requirements in accordance with the current **Wisconsin Building and Heating, Ventilating and Air conditioning Code:**

- the requirements of **s. Comm 63.16** and **63.17**.



Thermal performance requirements shall comply with the cited **International Building Code (IBC)** requirements below in accordance with the **Wisconsin Amended IBC Code (effective 7/01/02):**

the requirements of ss. **IMC 301.1** and **302.1, 702.1 [Comm 63.0701]** and **Chapter 8.**



This approval will be valid through December 31, 2007, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Building Product Evaluation number must be provided when plans that include this product are submitted for review.

DISCLAIMER

The department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Revision Date:

Approval Date: June 18, 2002

By: _____

Lee E. Finley, Jr.
Product & Material Review
Integrated Services Bureau